

IN THE SPECIFICATION

Please amend the TITLE of the application, beginning at page 1, line 1, as follows.

METHODS AND SYSTEMS FOR MOVING FLUID MICRODROPLETS IN A MICROFLUIDIC DEVICE

Please amend the paragraph of the specification beginning at page 4, line 18, as follows

Fig. 1 depicts a microfluidic system 100 that includes a microfluidic device 110 and corresponding cartridge 120, which receive one or more fluid samples and process the samples under the control of computer 127 and data acquisition and control board (DAQ) 126. Three inlet ports 122 for accepting fluid reagents or samples are shown. Preferably, these inlet ports are in standard position so that laboratory robot 154, where available, may be easily programmed for automatic loading of ports of several types of microfluidic systems. Otherwise, the ports 122 should be accessible for manual loading. Micro-circuit 123 is accessible through certain standard connectors for storing at least self-descriptive processor information.

Please amend the paragraph of the specification beginning at page 4, line 22, as follows

Computer 127 preferably performs high level functions, such as supplying a user interface that allows a user to select desired operations, notifying the DAQ 126 as to the selected operations, and displaying for the user the results of such operations. These operations include, for example, subjecting a sample to process steps within the various process zones of the microfluidic device. The computer 127 may be a portable computer to facilitate transport of the microfluidic system. Laboratory robot 154 is controlled via cable 131 from computer 127 so that microfluidic processor loading and processor operation can be conveniently and automatically controlled from a single computer. Alternatively, the robot may be controlled by a separate computer.

Please amend the paragraph of the specification beginning at page 6, line 30, as follows

Fig. 3 illustrates a top-down view of microfluidic device 110. As shown, the substrate has a sample input module 150 and reagent input module 152 to allow sample and reagent materials,

respectively, to be input to device 110. Preferably, input modules 150, 152 are disposed to allow automatic material input using a computer controlled laboratory robot 154 (as shown in Fig. 1).

Please amend the paragraph of the specification beginning at page 18, line 29, as follows

The mixed lysed cell sample and reagent are received within a DNA manipulation zone 971 of DNA manipulation module 162. Module 162 can perform, for example, restriction, digestion, ligation, hybridization and amplification of DNA material. In one embodiment, DNA manipulation zone 971 is configured to perform PCR amplification of nucleic acids present within the lysed cell sample. Vent 440 prevents pressure from increasing within zone 971 as the lysed cell sample and reagent are being introduced thereto. Valves 972 and 973 of DNA manipulation module 162 may be closed to prevent substances therein ~~[[zone]]~~ from exiting, such as by evaporation, during PCR amplification. The DNA manipulation zone is configured with heat sources under control of computer 127 to allow thermal cycling of DNA manipulation zone during amplification, as understood by one of skill in the art.

Please amend the paragraph of the specification beginning at page 19, line 9, as follows

System 901 ~~includes~~ also includes a detector 981 to detect the presence of amplified polynucleotides produced by PCR. Detector 981 is preferably an optical detector in optical communication, such as by a fiber optic ~~[[981]]~~, with zone 971. A light source, such as a laser diode, introduces light to DNA Manipulation zone 971 to generate fluorescence indicative of the amount of amplified polynucleotides present therein. The fluorescence arises from fluorescent tags, included in the reagent and associated with the polynucleotides upon amplification.